

Client: <b>City of Gustavus</b>	Product: <b>2022 Cure Pile</b>	Date Reported: 04/14/23
Attn: Paul Berry	Date Sampled: 03/27/23	Laboratory # <b>C23-476</b>
PO BOX 1	Date Received: 03/30/23	Revised by Brent Thyssen, CPSSc
Gustavus, AK 99826	<b>Invoice #: C23-476</b>	<b>PO#:</b>
907-697-2118		<b>Amount: \$255.00</b>

**Nutrients**

Method	As Received	Dry Wt.	Units	Low	Normal	High	Typical Range	
Moisture	70 C	58	%	*****			15 to 40	
Solids	70 C	42	%	*****			60 to 85	
pH	1:5	7.6	NA	SU	*****			5.5 to 8.5
E.C. (Sol. Salts)	1:5	2.8	6.5	mmhos/cm	*****			below 5.0
Total N	TMECC 04.02D	1.09	2.57	%	*****			1 to 5
Organic C	TMECC 04.01A	9.9	23.4	%	*****			18 to 45
Organic Matter	TMECC 05.07A	23.1	54.7	%	*****			40 to 60
Ash	550 C	19.2	45.3	%	*****			40 to 60
Ammonium -N	TMECC 05.02C	124	293	mg/kg	*****			90 to 450
Nitrate-N	TMECC 04.02B	220	520	mg/kg	*****			50 to 250
Phosphorous	TMECC 04.12B/04.14A	0.27	0.65	%	*****			
P <sub>2</sub> O <sub>5</sub>	calculation	0.63	1.49	%	*****			1 to 8
Potassium	TMECC 04.12B/04.14A	0.29	0.67	%	*****			
K <sub>2</sub> O	calculation	0.34	0.81	%	****			3 to 12
Calcium	TMECC 04.12B/04.14A	3.24	7.7	%	*****			0.5 to 10
Magnesium	TMECC 04.12B/04.14A	0.14	0.33	%	*****			0.05 to 0.7
Sodium	TMECC 04.12B/04.14A	0.24	0.56	%	*****			0.05 to 0.7
Sulfur	TMECC 04.12B/04.14A	0.12	0.30	%	*****			0.1 to 1.0
Boron	TMECC 04.12B/04.14A	6	13	mg/kg	*****			25 to 150
Zinc	TMECC 04.12B/04.14A	28	65	mg/kg	*****			100 to 600
Manganese	TMECC 04.12B/04.14A	54	128	mg/kg	*****			250 to 750
Copper	TMECC 04.12B/04.14A	9	21	mg/kg	***			100 to 500
Iron	TMECC 04.12B/04.14A	2585	6108	mg/kg	*****			1000 to 25000
C/N ratio		9		ratio	****			18 to 24
C/P Ratio		36		ratio	*****			80 to 140

**Respiration & Stability**

Method	Units	Low	Normal	High	Normal	
<b>CO2 Evolution</b>	TMECC 05.08	0.3	mg CO <sub>2</sub> -C/g OM/day	**		1 to 7
	TMECC 05.08	0.5	mg CO <sub>2</sub> -C/g TS/day	*****		0.5 to 5
<b>Stability Rating</b>	<b>Very Stable</b>					

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**Cucumber Bioassay**

Method	Units	Low	Normal	Normal
<b>Emergence</b> TMECC 05.05A	<b>100</b> %	*****		80 to 100
<b>Vigor</b> TMECC 05.05A	<b>82</b> %	*****		85 to 100
<b>Maturity</b> Mature: safe for use on gardens and fields				

**Pathogens**

Method	Date Tested	units	4/4/2023	Low	Normal	High	Normal
<b>Fecal Coliforms</b> TMECC 07.01AB	<b>NOT TESTED</b>	MPN/g					Less than 1000
<b>Salmonella</b> TMECC 07.02A	<b>ND</b>	MPN/4g	<b>Pass</b>	*			Less than 3

ND = None Detected      Fecal Coliforms MDL 5.4      MPN/g      Salmonella MDL 1      MPN/4g

**EPA 503 Metals**

Method	Dry Wt.	Units	Low	Normal	High	MDL	EPA Limit
<b>Arsenic</b> TMECC 04.12B/04.14A	<b>&lt;MDL</b>	mg/kg				1.05	41
<b>Cadmium</b> TMECC 04.12B/04.14A	<b>&lt;MDL</b>	mg/kg				0.19	39
<b>Chromium</b> TMECC 04.12B/04.14A	<b>8.4</b>	mg/kg				0.17	-
<b>Cobalt</b> TMECC 04.12B/04.14A	<b>1.6</b>	mg/kg	****			0.11	1200
<b>Copper</b> TMECC 04.12B/04.14A	<b>21.4</b>	mg/kg	****			0.25	1500
<b>Mercury</b> TMECC 04.12B/04.14A	<b>0.02</b>	mg/kg	****			0.002	17
<b>Molybdenum</b> TMECC 04.12B/04.14A	<b>2.9</b>	mg/kg	*****			0.08	75
<b>Nickel</b> TMECC 04.12B/04.14A	<b>4.1</b>	mg/kg	****			0.23	420
<b>Lead</b> TMECC 04.12B/04.14A	<b>&lt;MDL</b>	mg/kg				0.87	300
<b>Selenium</b> TMECC 04.12B/04.14A	<b>5.10</b>	mg/kg	*****			0.59	36
<b>Zinc</b> TMECC 04.12B/04.14A	<b>65</b>	mg/kg	****			0.74	2800
<b>Metals Assay</b>		<b>Pass</b>					

**Particle Size Distribution TMECC 2.02 B & C**

inches	mm	% Passing	Inerts	% by wt.
<b>3</b>	<b>76.2</b>	<b>100</b>		
<b>2</b>	<b>50</b>	<b>100</b>	Total Plastic	<b>0.00</b>
<b>1</b>	<b>25</b>	<b>96</b>	Film Plastic	0.00
<b>3/4</b>	<b>19.1</b>	<b>82</b>	Glass	<b>0.00</b>
<b>5/8</b>	<b>16</b>	<b>76</b>	Metal	<b>0.00</b>
<b>1/2</b>	<b>12.5</b>	<b>67</b>		<b>0.00</b>
<b>3/8</b>	<b>9.5</b>	<b>52</b>		
<b>1/4</b>	<b>6.3</b>	<b>29</b>	<b>Total</b>	<b>0.00</b>

Sample was received, handled and tested in accordance with TMECC procedures



**City of Gustavus**  
**Attn: Paul Berry**  
**PO BOX 1**  
**Gustavus, AK 99826**  
**907-697-2118**

DATE REC 30-Mar-23  
 INVOICE # 30-Mar-23  
 LAB # C23-476  
 Date Reported: 04/14/23

**NUTRIENT REPORT**

SAMPLE I.D.: 2022 Cure Pile

	<u>%SOLIDS</u>	<u>%WATER</u>
As Received:	42.32	57.68

TOTAL ELEMENTS	-----100%DRY-----		----AS RECEIVED-----	
	%	lbs/ton	%	lbs/ton
TN	2.57	51.40	1.09	21.8
P	0.65	12.98	0.27	5.5
P205	1.49	29.85	0.63	12.6
K	0.67	13.49	0.29	5.7
K20	0.81	16.19	0.34	6.9
S	0.30	5.91	0.12	2.5
Ca	7.67	153.3	3.24	64.9
Mg	0.33	6.59	0.14	2.8
Na	0.56	11.27	0.24	4.8
C	23.40	468	9.9	198
	<u>mg/kg</u>	<u>lbs/ton</u>	<u>mg/kg</u>	<u>lbs/ton</u>
Zn	65	0.13	28	0.06
Mn	128	0.26	54	0.11
Cu	21	0.04	9	0.02
Fe	6108	12.22	2585	5.17
B	13	0.03	5.50	0.01
Nitrate N	520	1.04	220.0	0.44
Ammonium N	293	0.59	124	0.25
C:N Ratio			9	
pH			7.6	
E.C.	6.53		2.76	



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<b>INTERPRETATION GUIDE</b>	

**SAFETY INTERPRETATIONS**

Pathogens

Fecal coliform bacteria are present in the gut and fecal mater of warm-blooded animals. Their presence is used as an indicator of the presence of possible human pathogens. The heat generated during proper composting is lethal to fecal coliform and other human pathogens. A test value below 1,000 per gram of compost is considered generally safe for human contact. As the compost is stored or transported, the temperature is no longer lethal for coliform bacteria and there is the possibility for regrowth or contamination by birds or other animals.

**Your compost was not tested for fecal coliform.**

Salmonella is a human pathogenic bacteria and a good indicator of other human pathogens. It is regularly used to monitor the likelihood of human pathogen presence in biosolids.

Your compost was tested for salmonella bacteria and found to be: **VERY SAFE**

Heavy Metals

9 heavy metals were identified with maximum concentration limits for land application in biosolids by USEPA in 40 CFR Part 503.B. Ongoing applications to the land are prohibited if any metal concentration exceed the limits in Table 3 of Part 503.13.

**If the bars on the "Heavy Metals" for your compost are within or below the "Normal" range, your compost is safe to use as a soil amendment.**

**COMPOST STABILITY AND MATURITY**

Respiration

Respiration is the measurement of microbially generated CO<sub>2</sub> from the compost when incubated at optimal temperature and moisture. It provides an indication of whether the composting process is complete and whether the compost is mature and ready for use. However, other factors may be limiting microbial activity (see C:N Ratio below)

**Your Compost was rated as Very Stable: well cured, finished compost; no odors or plant toxicity**

Maturity

Bioassay

Cucumbers are grown in a fixed blend of your compost and a commercial potting mix maintained at optimum moisture and temperature. Cucumbers are relatively insensitive to salinity, but very sensitive to ammonia, organic acids and herbicide residue. Emergence and Vigor are rated: results greater than 80% indicate that your compost is mature and/or contains no herbicide carryover. Very high salinity can also reduce assay results.

Your Compost Emergence % **100** Your Compost vigor % **82**

Total Nitrogen, Nitrate & Ammonium

Ammonia is produced as a gas in the early stages of composting. The ammonium is nitrified to nitrate as the compost matures. Ammonia is toxic to plants at relatively low concentrations but under moist conditions is converted to ammonium which is less toxic. Nitrate is not toxic, but does contribute to overall salinity if very high. The pH of the compost typically starts out low as organic acids are released, then increases as ammonia is produced, then settles back towards neutral (7.0) as ammonium is nitrified and the compost matures.

Your Compost Ammonium level was **293** Your Compost Ammonium:Nitrate ratio was **1**  
Your Compost Ammonium:Total N ratio was **0.01** Your Compost pH was **7.6**

Considering all the factors above, your Compost is **Mature: safe for use on gardens and fields**

**FERTILITY INTERPRETATIONS**

C:N Ratio

The carbon to nitrogen ratio is important to determine 1) if the composting process is complete or simply stalled out because of lack of nitrogen and 2) whether the compost, when applied to the soil, will act as a source of nitrogen for the crop or become a sink causing the crops to starve for nitrogen.

Your C:N ratio was **9** **Your compost is likely high in soluble N, watch for high ammonia levels as they can injure crops.**

Electrical Conductivity/Salinity

Electrical Conductivity is a convenient way to evaluate the soluble salts or salinity of a compost. High salinity is damaging to plants.

The EC of your Compost was **6.5** **M. High: best to dilute 1:3 to 1:10 for most applications**